

What is claimed is:

1. A multi-purpose tool for a front end loader of a tractor, comprising:

an intermediate support frame having a front side, a back side, a top side edge portion, a bottom side edge, and two side edges;

an upper movable jaw assembly including a plurality of interconnected forwardly extending, spaced-apart parallel fingers pivotally mounted to the top side edge portion of the intermediate support frame, said upper movable jaw assembly having a top side, a bottom side, an angled proximal section, a straight central section, and an angled distal section;

a lower stationary jaw assembly including a plurality of interconnected forwardly extending, spaced-apart parallel fingers fixedly mounted to the bottom side edge of the intermediate support frame, said lower stationary jaw assembly having a top side, a bottom side, an angled proximal section, a straight central section, and a straight distal section;

said upper moveable jaw assembly having a length that is greater than a length of the lower stationary jaw assembly;

said angled proximal section of the upper moveable jaw assembly and said angled distal section of the upper moveable jaw

assembly each being angled downward relative to said straight central section of said upper moveable jaw assembly;

said angled proximal section of the lower stationary jaw assembly being angled upward relative to said straight central section of said lower stationary jaw assembly;

a bracket assembly fixedly attached to the back side of the intermediate support frame, said bracket assembly capable of mounting the multi-purpose tool to a front end loader;

a hydraulic system including at least one hydraulic cylinder positioned on the back side of the intermediate support frame, said hydraulic cylinder being operationally connected to a pivoting sleeve fixedly attached to the top side of the angled proximal section of the upper moveable jaw assembly,

wherein actuation of the at least one hydraulic cylinder is capable of causing the upper moveable jaw assembly to pivot from an open to a closed position or from a closed to an open position relative to the lower stationary jaw assembly and wherein in the closed position the angled distal section of the upper movable jaw assembly is positioned below the lower stationary jaw assembly.

2. The multi-purpose tool for a front end loader of a tractor according to claim 1, wherein the intermediate support frame comprises:

a bottom support beam;

5 a plurality of support posts extending upward and perpendicular to said bottom support beam, each of said plurality of support posts having an upper end and a lower end, said lower end of each of said plurality of support posts being fixedly attached to the bottom support beam.

10 3. The multi-purpose tool for a front end loader of a tractor according to claim 1, wherein the plurality of interconnected forwardly extending, spaced-apart parallel fingers of the upper moveable jaw assembly are interconnected by at least
15 two cross-bars.

20 4. The multi-purpose tool for a front end loader of a tractor according to claim 3, wherein one of said at least two cross-bars is positioned at a first end of the straight central section of the upper moveable jaw assembly and another one of said at least two cross-bars is positioned at a second end of the straight central section of the upper moveable jaw assembly.

5. The multi-purpose tool for a front end loader of a tractor according to claim 1, wherein the plurality of interconnected forwardly extending, spaced-apart parallel fingers of the upper moveable jaw assembly are pivotally mounted to the top side edge portion of the intermediate support frame by a hinge means.

6. The multi-purpose tool for a front end loader of a tractor according to claim 5, wherein the hinge means comprises:

a first plurality of spaced-apart hinge tubes, each hinge tube being fixedly attached to a proximal end of a different one of said plurality of forwardly extending, spaced-apart parallel fingers of the upper moveable jaw assembly;

a second plurality of spaced-apart hinge tubes, each hinge tube being fixedly attached to the top side edge portion of the intermediate support frame;

said first and second plurality of spaced-apart hinge tubes being aligned together in a single-row to form an elongated continuous tube having opposite open ends;

a hinge rod positioned within the elongated continuous tube;
a closure means secured to each opposite end of the elongated continuous tube to maintain the hinge rod therein.

7. The multi-purpose tool for a front end loader of a tractor according to claim 6, wherein each hinge tube of the first and second plurality of spaced-apart hinge tubes includes a lubricant access port capable of permitting introduction of a lubricant into an internal cavity in the hinge tube around an outer surface of a portion of the hinge rod.

8. The multi-purpose tool for a front end loader of a tractor according to claim 1, wherein the angle of the angled proximal section of the upper moveable jaw assembly and the angle of the distal section of the upper moveable jaw assembly are each between 30 and 40 degrees relative to the straight central section of the upper moveable jaw assembly.

9. The multi-purpose tool for a front end loader of a tractor according to claim 1, wherein the plurality of interconnected forwardly extending, spaced-apart parallel fingers of the lower stationary jaw assembly are interconnected by at least two cross-bars.

10. The multi-purpose tool for a front end loader of a tractor according to claim 9, wherein one of said at least two cross-bars is positioned at a first end of the straight central section of the lower stationary jaw assembly and another one of said at least two cross-bars is positioned at a second end of the straight central section of the lower stationary jaw assembly.

11. The multi-purpose tool for a front end loader of a tractor according to claim 1, wherein the angle of the angled proximal section of the lower stationary jaw assembly is between 30 and 40 degrees relative to the straight central section of the lower stationary jaw assembly.

12. The multi-purpose tool for a front end loader of a tractor according to claim 1, wherein a cover plate is fixedly attached to the front side of the intermediate support frame.

13. The multi-purpose tool for a front end loader of a tractor according to claim 2, wherein the plurality of interconnected forwardly extending, spaced-apart fingers of the upper moveable jaw assembly are pivotally mounted to the top side edge portion of the intermediate support frame by a hinge means, said hinge means comprising:

a first plurality of spaced-apart hinge tubes, each hinge tube being fixedly attached to a proximal end of a different one of said plurality of forwardly extending, spaced-apart parallel fingers of the upper moveable jaw assembly;

a second plurality of spaced-apart hinge tubes, each hinge tube being fixedly attached to the upper end of a different one of said plurality of support posts of said intermediate support frame;

said first and second plurality of spaced-apart hinge tubes being aligned together in a single-row to form an elongated continuous tube having opposite open ends;

a hinge rod positioned within the elongated continuous tube;

a closure means secured to each opposite end of the elongated continuous tube to maintain the hinge rod therein.

14. A multi-purpose tool for a front end loader of a tractor,
comprising:

an intermediate support frame having a front side, a back
side, a top side edge portion, a bottom side edge, and two side
5 edges;

an upper movable jaw assembly including a plurality of
interconnected forwardly extending, spaced-apart parallel fingers
pivotally mounted to the top side edge portion of the intermediate
support frame, said upper movable jaw assembly having a top side,
10 a bottom side, an angled proximal section, a straight central
section, and an angled distal section;

a means for pivotally mounting the plurality of interconnected
forwardly extending, spaced-apart parallel fingers of the upper
moveable jaw assembly to the top side edge portion of the
15 intermediate support frame;

a lower stationary jaw assembly including a plurality of
interconnected forwardly extending spaced-apart parallel fingers
fixedly mounted to the bottom side edge of the intermediate support
frame, said lower stationary jaw assembly having a top side, a
20 bottom side, an angled proximal section, a straight central
section, and a straight distal section;

said upper moveable jaw assembly having a length that is
greater than a length of the lower stationary jaw assembly;

said angled proximal section of the upper moveable jaw assembly and said angled distal section of the upper moveable jaw assembly each being angled downward relative to said straight central section of said upper moveable jaw assembly;

5 said angled proximal section of the lower stationary jaw assembly being angled upward relative to said straight central section of said lower stationary jaw assembly;

10 a means for mounting the multi-purpose tool to a front end loader, said means for mounting being fixedly attached to the back side of the intermediate support frame;

a hydraulic system including a first hydraulic cylinder and a second hydraulic cylinder each positioned on the back side of the intermediate support frame;

15 said first hydraulic cylinder having a lower end and an upper moveable rod end, said lower end of the first hydraulic cylinder being coupled to a connecting sleeve fixedly attached to the bottom side of the intermediate support frame, said upper moveable rod end of the first hydraulic cylinder being coupled to a lever arm of a first pivoting sleeve fixedly attached to a proximal end of one of
20 said plurality of forwardly extending, spaced-apart parallel fingers of the upper moveable jaw assembly;

said second hydraulic cylinder having a lower end and an upper moveable rod end, said lower end of the second hydraulic cylinder

being coupled to a connecting sleeve fixedly attached to the bottom side of the intermediate support frame, said upper moveable rod end of the second hydraulic cylinder being coupled to a lever arm of a second pivoting sleeve fixedly attached to a proximal end of another one of said plurality of forwardly extending, spaced-apart parallel fingers of the upper moveable jaw assembly;

wherein actuation of the first and second hydraulic cylinders causes the upper moveable jaw assembly to pivot from an open to a closed position or from a closed to an open position relative to the lower stationary jaw assembly and wherein in the closed position the angled distal section of the upper moveable jaw assembly is positioned below the lower stationary jaw assembly.

15. The multi-purpose tool for a front end loader of a tractor according to claim 14, wherein the means for mounting the multi-purpose tool to a front end loader comprises:

an upper bracket support bar fixedly attached to the back side of the intermediate support frame;

a lower bracket support bar fixedly attached to the back side of the intermediate support frame;

a first bracket beam interconnecting the upper and lower bracket support bars;

a second bracket beam interconnecting the upper and lower bracket support bars;

said first and second bracket beams each having a back surface with an upper and lower end;

5 a first U-shaped bracket fixedly attached to the upper end of the back surface of the first bracket beam, said first U-shaped bracket capable of accommodating an upper portion of a tool connecting platform of a first front end loader arm;

10 a first retaining plate fixedly attached to the lower end of the back surface of the first bracket beam, said first retaining plate capable of detachably securing to a lower portion of the tool connecting platform of the first front end loader arm;

15 a second U-shaped bracket fixedly attached to the upper end of the back surface of the second bracket beam, said second U-shaped bracket capable of accommodating an upper portion of a tool connecting platform of a second front end loader arm;

20 a second retaining plate fixedly attached to the lower end of the back surface of the second bracket beam, said second retaining plate capable of detachably securing to a lower portion of the tool connecting platform of the second front end loader arm.

16. The multi-purpose tool for a front end loader according to claim 15, wherein the first retaining plate has a retaining pin protruding therefrom which is capable of being detachably received within a bore located in the lower portion of the tool connecting platform of the first front end loader arm and wherein the second retaining plate has a retaining pin protruding therefrom which is capable of being detachably received within a bore located in the lower portion of the tool connecting platform of the second front end loader arm.

17. The multi-purpose tool for a front end loader according to claim 14, further comprising a bracing beam fixedly attached to the top side of the upper moveable jaw assembly, said bracing beam bracing the first and second pivoting sleeves which are fixedly attached thereto.

18. A method of operating a multi-purpose tool for a front end loader of a tractor, comprising the steps of:

providing a multi-purpose tool for a front end loader comprising:

an intermediate support frame having a front side, a back side, a top side edge portion, a bottom side edge, and two side edges;

an upper movable jaw assembly including a plurality of interconnected forwardly extending, spaced-apart parallel fingers pivotally mounted to the top side edge portion of the intermediate support frame, said upper movable jaw assembly having a top side,
5 a bottom side, an angled proximal section, a straight central section, and an angled distal section;

a lower stationary jaw assembly including a plurality of interconnected forwardly extending, spaced-apart parallel fingers fixedly mounted to the bottom side edge of the intermediate support
10 frame, said lower stationary jaw assembly having a top side, a bottom side, an angled proximal section, a straight central section, and a straight distal section;

said upper moveable jaw assembly having a length that is greater than a length of the lower stationary jaw assembly;

15 said angled proximal section of the upper moveable jaw assembly and said angled distal section of the upper moveable jaw assembly each being angled downward relative to said straight central section of said upper moveable jaw assembly;

said angled proximal section of the lower stationary jaw
20 assembly being angled upward relative to said straight central section of said lower stationary jaw assembly;

a bracket assembly fixedly attached to the back side of the intermediate support frame, said bracket assembly capable of mounting the multi-purpose tool to the front end loader;

5 a hydraulic system including at least one hydraulic cylinder positioned on the back side of the intermediate support frame, said hydraulic cylinder being operationally connected to a pivoting sleeve fixedly attached to the top side of the angled proximal section of the upper moveable jaw assembly,

10 wherein actuation of the at least one hydraulic cylinders is capable of causing the upper moveable jaw assembly to pivot from an open to a closed position or from a closed to an open position relative to the lower stationary jaw assembly and wherein in the closed position the angled distal section of the upper movable jaw assembly is positioned below the lower stationary jaw assembly;

15 attaching the multi-purpose tool to the front end loader;

connecting the hydraulic system of the multi-purpose tool to a hydraulic actuation unit of the front end loader in order to make the hydraulic system operational;

20 actuating the hydraulic system to cause the upper moveable jaw assembly to pivot towards or away from the lower stationary jaw assembly.

19. The method according to claim 18, further comprising the step of:

tilting the multi-purpose tool for a front end loader in a clockwise or counter-clockwise direction.

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20. The method according to claim 18, further comprising the step of:

raising or lowering the multi-purpose tool for a front end loader relative to a ground surface.